

BACTERIOLOGICAL NEWS

Society of American Bacteriologists

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OFFICE OF THE
SECRETARY

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	Richard Donovick (1957)	K. B. Raper (1958)	J. H. Hanks (1959)

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Plan now to attend
The 57th General Meeting of
The Society of American Bacteriologists
Sheraton-Cadillac and Statler Hotels
Detroit, Michigan
April 28-May 2, 1957

The 57th General Meeting of the Society of American Bacteriologists will convene in Detroit, Michigan on Sunday evening, April 28, 1957 with an address by an outstanding speaker from the Midwest. Following this opening general session the traditional smoker will be held in the Hotel Statler.

The headquarters hotels for the meeting will be the Sheraton-Cadillac and Statler. The scientific sessions, which will begin on Monday morning April 29, will be divided between these two hotels, both of which face on Washington Boulevard. Commercial exhibits and registration facilities will be located in the Sheraton-Cadillac Hotel as will press room and other facilities. Scientific exhibits will be in the Statler Hotel.

To facilitate the movement of members between the two hotels (about 4 blocks) chartered busses will continuously circle Washington Boulevard making the round trip in approximately five minutes. Your badge will be your ticket.

In addition to the many interesting and stimulating papers and symposia to be presented the local committee is planning a number of activities designed to make your visit to Detroit both a profitable and an enjoyable one. Also (a very important item!) a committee headed by Mrs. Norma Broom is planning special events for the ladies!

The tours committee is making arrangements for visits to industrial plants, and historical, art and scientific centers as well as a general tour of Detroit. The plans include: General Motors Technical Center, Parke, Davis and Company, Ford Motor Company, Plymouth Division of the Chrysler Corporation, Hiram Walker and Sons, Limited (Canada), Greenfield Village (Dearborn), Cranbrook Institutes of Art and Science (Bloomfield Hills), and a general sightseeing tour.

The president's reception will be held on Wednesday evening, May 1 in the Sheraton-Cadillac Hotel. Plans for this event are in the making and more detailed information will be available later.

For the benefit of those planning to attend this meeting the respective committees submit the following information:

Registration

The plan of preregistration, successfully inaugurated by the Texas Committee, will be continued. To preregister members should:

1. Fill out the enclosed card and return it as soon as possible.
2. Please promptly notify the registration committee (Miss Elizabeth Cope, Herman Kiefer Hospital, Detroit) of any change in plans.
3. Upon arrival in Detroit, go to the registration desk at the Sheraton-Cadillac Hotel and complete your registration by giving the clerk at the desk your Detroit address and pay the registration fee. You will, at this time receive your badge and envelope.

Those who cannot preregister or who have failed to do so will find regular registration facilities at the Sheraton-Cadillac.

Students must have a certifying letter from their professors.

Please remember whether or not you have preregistered and avoid going to the wrong desk!

Registration will begin at 1:00 PM, Sunday, April 29 and the desk will remain open until 7:00 PM. On Monday, the hours will be 8 AM to 5 PM and Tuesday-Thursday, 9 AM to 5 PM.

Room Reservations

As a convenience to those desiring hotel accommodations for the forthcoming SAB meeting, all reservations will be handled by a housing committee in cooperation with the Detroit Convention and Tourist Bureau. To obtain reservations the enclosed form must be filled out completely and returned as directed. Preference may be made for the Sheraton-Cadillac or Statler Hotels, joint headquarters for the meetings. Those members who are familiar with Detroit and who wish to do so may indicate choice of any other hotel in the city as well. The committee will endeavor to make reservations at these hotels, but guarantees for rooms have been made to the committee only by the two hotels named.

Only one form, listing all names, need be returned for members desiring to share rooms or to occupy dormitory quarters. In this case reservation con-

firmation will be sent by the hotels to one member only, as indicated on the form.

Returning request forms early will help assure reservations in the hotel of the member's choice. The hotels will not guarantee acceptance of reservations after April 15th.

Special Meals

The Special Meals Committee will make arrangements for alumni or other groups desiring to get together for a meal during the SAB meetings. The minimum price for breakfast in the hotels is \$2.88, for lunch, \$3.45 or \$3.74 and for dinner \$4.89 or \$5.18, including tax and gratuity. The hotels require a 24 hour guarantee on the number of reservations. This is standard practice and several groups have been seriously embarrassed in recent years, by failures of those with reservations to show up.

For a cocktail hour the hotel charges \$17.50 for a bartender, or there will be no charge for a bartender if \$150.00 worth of drinks are sold a la carte.

The committee will need to know by February 15 those groups desiring to have a meal or cocktail hour scheduled in order to include the notice in the program. We will also need to know the approximate size of the group and your preference as to time and place by February 15 since space is limited and room arrangements must be made well in advance.

Requests or inquiries should be sent to Dr. Caroline Hebb, Detroit Institute of Cancer Research, 4811 John R Street, Detroit 1, Michigan.

Round Tables

Once again plans are afoot to provide small meeting rooms for round-table discussions and conferences not provided for in the printed program. Any member desiring to reserve such a meeting room may do so, preferably some weeks in advance, by writing Dr. John Ehrlich, Parke, Davis and Company, Detroit 32, Michigan. An effort will be made to handle last-minute requests for meeting rooms at the registration desk in the Sheraton-Cadillac Hotel.

Publicity

A continued effort to improve the publicity relating to meetings is being made. Press room facilities will be located in the Sheraton-Cadillac Hotel. News releases will be prepared on selected papers accepted by the program committee and these will be made available to members of the press.

Your Society feels that proper liaison with the public and with other scientific groups is of considerable importance. We therefore earnestly

request that all members cooperate completely and promptly with all requests made by the program and publicity committees. *It is especially desired that all persons whose papers have been accepted by the program committee make available to the publicity committee, at the earliest possible moment, a copy of the manuscript of their papers.* These will be held in strictest confidence, will be filed alphabetically, and will be available to the press on the day your paper is delivered. Many press writers prefer to prepare their own releases. In such cases the release will be checked, for accuracy, by a member of the publicity committee, or if possible by the author, before it is released.

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JAMES MORGAN SHERMAN

1890-1956

James M. Sherman, professor of bacteriology at Cornell University, died in his sleep November 5th.

Dr. Sherman was born in Ash Grove, Virginia, May 6, 1890. After graduating from North Carolina State College of Agriculture and Engineering he entered the Graduate School of the University of Wisconsin where he received the M.S. degree in bacteriology in 1912 and Ph.D. in 1916. From 1917 to 1923 he served as bacteriologist in the U. S. Department of Agriculture, leaving that post to become professor of bacteriology and head of the Department of Dairy Industry at Cornell University. He relinquished his administrative duties as department head July 1, 1955 to devote his full time to writing and research.

Dr. Sherman found time in his fruitful career to give freely of his time to the S.A.B. He served as Secretary-Treasurer from 1923 to 1935, as President in 1937, Associate Editor of Bacteriological Reviews (1937-1944) and as Editor of the Journal of Bacteriology from 1945 to 1951.

Dr. Sherman is the author of over 100 research

papers, a book on laboratory methods in bacteriology and a monograph on the streptococci. He also served on the editorial committee of the Annual Reviews of Microbiology and as a member of the Board of Editors of the Cornell University Press.

SOCIETY OFFICERS, 1957

The committee of tellers, consisting of Drs. E. J. Herbst, D. E. Shay and A. G. Smith met in Baltimore December 15, 1956 to count the ballots cast in the election of officers of the Society for 1957. The following were elected: President, Perry W. Wilson; Vice-President, Harry Eagle; Secretary, E. M. Foster; Treasurer, John Hays Bailey; Councilors-at-Large, I. C. Gunsalus and R. E. Hungate. The tally of ballots follows:

President:

Perry W. Wilson	
Yes.....	2359
No.....	19
Ballots not voted.....	21
Total.....	2399

Vice-President:

Harry Eagle.....	1023
Colin M. MacLeod.....	887
David T. Smith.....	424
Ballots not voted.....	65
Total.....	2399

Secretary:

Edwin Michael Foster	
Yes.....	2349
No.....	13
Ballots not voted.....	37
Total.....	2399

Treasurer:

John Hays Bailey	
Yes.....	2256
No.....	23
Ballots not voted.....	120
Total.....	2399

Councilor-at-Large:

I. C. Gunsalus.....	1524
E. R. Hitchner.....	1065
R. E. Hungate.....	1188
W. F. Verway.....	682
Total ballots cast.....	2399

There were two write-in votes for Vice-President and for Councilor-at-Large.

The Council has elected John H. Hanks a member of the Council Policy Committee for the term ending December 31, 1959.

BIBLICAL MICROBIOLOGY*

Although the title may indicate to the contrary this is not an attempt to predate the science of Microbiology. The Bible is a religious history of a group of people. Religion is a way of life; hence, the Bible records much about a period of living that antedates ours considerably. Few would deny that microbes have been a part of this world for many years. It is interesting to some to try and detect their presence in bygone days. Usually this must be done indirectly, that is, by noting the effects of the organisms we postulate their presence.

As in any other historical research it is well to examine closely the source material from which one collects his data. In the present instance the sources have been chiefly twofold, the Bible (1) itself and a two-volume work, "Travels in Arabia Deserta," by C. M. Doughty (2). I shall discuss the latter work first. In the preface to the third edition Doughty points out the reason why a student of the Bible would be interested in his writings, "As for the nomad Arabs, camel and sheep herds, dwellers in the black booths and curtains of hair-cloth, (named by them 'houses of hair'): we may see in them that desert life, which was followed by their ancestors, in the Biblical tents of Kedar.

"While like phrases of their nearly-allied and not less ancient speech, are sounding in our ears, and their like customs, come down from antiquity, are continued before our eyes; we almost feel ourselves carried back to the days of the nomad Hebrew Patriarchs; (which, though in our brief lives, they seem very remote, are but a moment of geological time). And we are the better able to read the bulk of the Old Testament books, with that further insight and understanding, which comes of a living experience."

T. E. Lawrence considers the work a Bible of its kind, pointing out how Doughty lived for two years with the Bedouin writing down word for word what he saw, felt and heard. Doughty was a poor man who tried to maintain himself by the practice of rational medicine, in a society more willing to invest in charms. Since Doughty lived with them prior to 1880 and the first civilization inroads commenced in 1909, the coming of the railroad to those parts, it is felt he obtained a picture of these people that will never again be reproducible. It is from his books we are better able to understand some of the Biblical practices to which we shall allude.

The Testaments themselves shall, of course, serve as the main source. While this may be an unimpeachable source indeed, several observations

seem necessary as we search the contents for references to microbes.

When the Bible is mentioned as a book the usual connotation is a beautiful, well-bound volume, set forth in the best King's English or an American counterpart. Many fail to realize the tremendous translation endeavor that has preceded the invaluable text available to us today. As to why a word, clause or sentence may have more than one meaning becomes more apparent when the condition of our oldest manuscripts is appreciated.

The oldest manuscripts available are written in what is termed cursive style. Capital letters are used throughout and each line consists of the letters all pushed together with no spacing for words, no punctuation and no paragraphs. The translator must know his word endings very well in order to separate the words and understand the meaning. More than one meaning could be possible. An example of how this could work is listed below.

THE ENEMY IS NOWHERE

THE ENEMY IS NO WHERE

THE ENEMY IS NOW HERE

Note the entirely different meaning dependent on two legitimate separations. We can feel most fortunate, however, since devoted scholars have furnished us with a most excellent translation in our modern Bible.

The period of time covered by the investigation is uncertain. Written Hebrew probably does not predate 1,000 B.C. by any great amount. The oral record precedes this, of course. Intrinsic evidence allows for a chronology of no more than 4,004 B.C., however. Dates preceding the founding of the Kingdom of David (circa 1,000 B.C.) are uncertain. We admit our limitations then as we dig back into the deep reaches of a dim past. Not every reference discovered will be read for some duplicate others. Not all of each reference cited will be read for some are too long and interest would surely lag before the end would be reached. We shall sample as we go.

The subject matter could be assembled on the basis of period of time, contributor, or by subject. I have chosen the last hoping to gain more continuity by this method. I hope to make passing comments concerning time and contributor as we handle each episode or group of episodes.

It is difficult to establish just when yeast was first used in the preparation of bread. No doubt leavening is a very old procedure. Certainly we are to find it in the first, and no doubt the oldest section of the Old Testament—the Pentateuch. It is in Exodus that we learn how the Hebrews established the custom of eating unleavened bread. Exodus 12: 33-34 reads as follows "And the Egyptians were urgent with the people, to send

*Presidential address, 1956. Fall meeting of the North Central Branch of the Society of American Bacteriologists.

them out of the land in haste; for they said, 'We are all dead men.' So the people took their dough before it was leavened, their kneading bowls being bound up in their mantles on their shoulders." That leavening of bread was customary is obvious because it requires a forceful decree by Moses to stop the procedure. Exodus 12: 14-15 makes this clear—"This day shall be for you a memorial day, and you shall keep it as a feast to the Lord; throughout your generations you shall observe it as an ordinance for ever. Seven days you shall eat unleavened bread; on the first day you shall put away leaven out of your houses for if anyone eats what is leavened, from the first day until the seventh day that person shall be cut off from Israel."

From their usage of the term they understood the function of leavening even though we can be quite certain they would not know a yeast cell if they saw one. From I Corinthians 5: 6-7 their concept of leavening becomes apparent, "Your boasting is not good. Do you not know that a little leaven ferments the whole lump of dough? Cleanse out the old leaven that you may be fresh dough, as you really are unleavened." Those of you who remember the situation in the Corinthian church recognize that a moral issue was involved here but the important point to this presentation is that in drawing from personal and menial experiences for an illustration we know they understood something about the workings of yeast.

As microbiologists we know yeasts are used for purposes other than breadmaking. Apparently wine-making is an industry almost as old as man himself. The Hebrew people considered wine a staple used in trading, payment of debts and even for tithing. We read in Nehemiah 10: 38-39 "And the priest, the son of Aaron, shall be with the Levites when the Levites receive the tithes; and the Levites shall bring up the tithe of the tithes to the house of our God, to the chambers, to the storehouse. For the people of Israel and the sons of Levi shall bring the contribution of grain, wine, and oil to the chambers, where are the vessels of the sanctuary, and the priests that minister, and the gate keepers and the singers. We will not neglect the house of our God."

Apparently the fermentation process was carried sufficiently far that the product could correctly be called wine and not grape juice. We learn this from Proverbs. Tradition has it Solomon wrote Proverbs—certainly there is much wisdom expressed therein. Proverbs 23: 29-35 may be read, perhaps as was intended, as a dialogue between a drunk and a sober person. Certainly the change in pronouns would so indicate. *The drunk*, "Who has woe? Who has sorrow? Who has strife? Who has complaining? Who has wounds without cause? Who has redness of eyes?" *The sober*, "Those who tarry long over wine, those who go to try mixed wine. Do not look

at wine when it is red, when it sparkles in the cup and goes down smoothly. At the last it bites like a serpent, and stings like an adder. Your eyes will see strange things, and your mind utter perverse things. You will be like one who lies down in the midst of the sea, like one who lies on the top of a mast. 'They struck me,' you will say, 'but I was not hurt; they beat me, but I did not feel it.'" *The drunk*, "When shall I awake? I will seek another drink."

There is some evidence of stronger fermentation than wine—Proverbs 20: 1 states "Wine is a mocker, strong drink a brawler; and whoever is led astray by it is not wise." The consequence of gas formation during the fermentation process was understood and guarded against. Luke 5: 37-38 "And no one puts new wine into old wineskins; if he does, the new wine will burst the skins and it will be spilled, and the skins will be destroyed. But new wine must be put into fresh wineskins."

By accident or design not all sugar was fermented to alcohol. Vinegar was a well known product during Testamental times. Psalms 69: 21 reads, "They gave me poison for food and for my thirst they gave me vinegar to drink." It may be assumed they knew several of its objectionable qualities. Proverbs 10: 26 states one, "Like vinegar to the teeth, and smoke to the eyes, so is the sluggard to those who send him." There is yet another reference, perhaps even more forceful—Proverbs 25: 20, "He who sings songs to a heavy heart is like one who takes off a garment on a cold day, and like vinegar on a wound." The last clause is no doubt a commentary on the voice the writer has in mind. At least occasionally neither the *Saccharomyces* nor *Acetobacter* triumphed and the product was spoiled. At least reference is made to foamy or spoiled wine in Psalms 75: 6-8, "For not from the east or from the west and not from the wilderness comes lifting up; but it is God who executes judgment, putting down one and lifting up another. For in the hand of the Lord there is a cup, with foaming wine, well mixed; and he will pour a draught from it, and all the wicked of the earth shall drain it down to the dregs."

Water pollution was common in the Holy Land. A good spring was an enviable possession, a polluted one an abomination, Proverbs 25: 26—"Like a muddied spring or a polluted fountain is a righteous man who gives way before the wicked."

Food spoilage was recorded in Exodus as the Hebrews wandered about in the wilderness, Exodus 16: 15-20 and 22-24, "... 'It is bread which the Lord has given you to eat. . . . Gather of it, every man of you, as much as he can eat. . . . Let no man leave any of it till the morning.' But they did not listen to Moses; some left part of it till the morning, and it bred worms and became foul; and Moses was angry with them. . . . Moses. . . said to them, 'Tomorrow is a day of solemn rest, a holy Sabbath

to the Lord; bake what you will bake and boil what you will boil' . . . so they laid it by till morning . . . and it did not become foul and there were no worms in it." Hence, even some 1,200 years B.C., the Hebrews were employing heat to fight food spoilage.

While we are on the topic of food processing the question of milk preservation without pasteurization in a hot country such as the one about which we speak would seem to be a real problem. Milk was a favorite food—undoubtedly much was consumed fresh when possible—some was soured to prevent putrefaction. All of these methods worked well when one could follow the camel herd and some of them were in milk. The solitary traveler or those who traveled without camels had a problem not as easily surmounted. We run into the term "curd(s)" repeatedly in the Old Testament, e.g. Genesis 18: 7-8, "And Abraham ran to the herd, and took a calf, tender and good, and gave it to the servant, who hastened to prepare it. Then he took *curds*, and *milk*, and the calf which he had prepared, and set it before them; and he stood by them under the tree while they ate." Obviously curds are eaten even when fresh milk is available. This idea is confirmed in Judges 5: 24-25, "Most blessed of women be Jael, the wife of Heber the Kenite, of tent-dwelling women most blessed. He asked water and she gave him milk, she brought him curds in a lordly bowl." Isaiah 7: 15 shows us that "curds and honey" are considered a delicacy, "He shall eat curds and honey when he knows how to refuse the evil and choose the good." Ibid. 22-23, "In that day a man will keep alive a young cow and two sheep; and because of the abundance of milk which they give, he will eat curds; for every one that is left in the land will eat curds and honey." Proverbs 30: 33 relates something about the manufacture of curds, "For pressing milk produces curds, pressing the nose produces blood, and pressing anger produces strife."

From comments by Doughty we learn the Bedouins drink some of the camel's milk fresh, some they pour in a souring skin, whereafter the housewife shakes it a bit and it is set aside for the evening meal. It is served as sour milk which the Bedouin thinks is even more refreshing than fresh milk. Milk is stored from one season to the next or even into the second year as mereesy which is a dried milk or buttermilk, dried by boiling to the hard shard, and resembles chalk. It is considered an excellent supplement for the date diet. Doughty did not hesitate to set out across the desert with this dried curd as a sole source of food if he could be assured of encountering water every third day. Dried milk then for the purpose of thwarting spoilage as well as saving space is probably an old invention.

Quick decomposition was well known in Palestine. The deceased were buried the same day they

died. Mark 15: 43-45, "Joseph of Arimathea . . . went to Pilate and asked for the body of Jesus. And Pilate wondered if he were already dead. And when he learned from the centurion that he was dead he granted the body to Joseph." Within four days decomposition would be present to considerable extent; John 11: 39, "Jesus said, 'Take away the stone.' Martha, the sister of the dead man, said to him, 'Lord, by this time there will be an odor, for he has been dead four days.'"

Apparently the art of embalming used to preserve Jacob was not revealed to the Hebrews or if they knew how they forgot or elected not to use it. Genesis 50: 2-3, "And Joseph commanded his servants the physicians to embalm his father, so the physicians embalmed Israel; forty days were required for it, for so many are required for embalming."

Speaking of physicians Job had a rather low opinion of those who professed to be physicians in his day, Job 13: 1-4, "Lo, my eye has seen all this, my ear has heard and understood it. What you know, I also know; I am not inferior to you. But I would speak to the Almighty, and I desire to argue my case with God. As for you, you whitewash with lies; worthless physicians are you all." Jeremiah wonders if there are any physicians in Gilead since so much balm comes therefrom, Jeremiah 8: 22—"Is there no balm in Gilead? Is there no physician there? Why then has the health of the daughter of my people not been restored?" From what we read in Genesis 37: 25 the balm of Gilead was an important item of trade, "Then they sat down to eat; and looking up they saw a caravan of Ishmaelites coming from Gilead, with their camels bearing gum, balm and myrrh, on their way to carry it down to Egypt." Scholars of the Old Testament believe the balm was used for medicinal purposes but are uncertain as to its nature. According to George Adam Smith (3) the site of old Gilead is unknown. According to the Bible considerable activity occurred there but there is no hint as to what the balm may have been nor from what it was derived.

The myrrh was probably used by a perfumer. Deodorants apparently go back to antiquity, Exodus 37: 29—"He made the holy anointing oil also, and the pure fragrant incense, blended as by the perfumer." Hyssop, a shrub of sweet smelling leaves is used for cleansing in Psalms 51: 7, "Purge me with hyssop, and I shall be clean; wash me, and I shall be whiter than snow."

Isolated afflictions and epidemics are recorded in the Bible. In most instances one can but guess as to the true nature of the illness. It is possible that some diseases of that period are no longer known to us. One of the earliest to be recorded is the plague of boils visited on the Egyptians which also struck the cattle—Exodus 9: 8, "And the Lord said to Moses and Aaron, 'Take handfuls of ashes from the kiln, and let Moses throw them heavenward in the sight

of Pharaoh. And it shall become a fine dust over all the land of Egypt. So they took ashes from the kiln and stood before Pharaoh, and Moses threw them toward heaven, and it became boils breaking out in sores on man and beast." The Septuagint translates, "painful blisters or ulcers," suggesting small pox. It would be interesting to know how serious a disease cow pox was when it first attacked cattle. It would be important also to know if the Hebrews, in their wretched circumstance, had gone through a prior epidemic.

In II Kings 20: 7 and in Isaiah 38: 21 reference is made to the treatment of what was perhaps a boil, "And Isaiah said, 'Bring a cake of figs, And let them take and lay it on the boil, that he may recover.'" A fig poultice as it were. No one knows for certain what Job had except a loathsome disease and patience beyond most humans. Job 2: 7-8 reads, "So Satan went forth from the presence of the Lord, and afflicted Job with loathsome sores from the sole of his foot to the crown of his head. And he took a potsherd (broken piece of pottery) with which to scrape himself and sat among the ashes." Perhaps this is small pox. If it were small pox and if it were customary to sit among the ashes and scrape one's self with a piece of pottery, then it might not be too difficult to imagine what happened to the Egyptians when Moses threw the ashes from the kiln heavenward. If Job had small pox it must have been hemorrhagic, Job 30: 30, "My skin turns black and falls from me." Could the latter be desquamation?

It is quite impossible to tell if the disease threatened in Leviticus actually even befell the Hebrew people. Leviticus 26: 14-16 reads, "But if you will not hearken to me, and will not do all these commandments, if you spurn my statutes, and if your soul abhors my ordinances, so that you will not do all my commandments, but break my covenant, I will do this to you: I will appoint over you sudden terror, consumption, and fever that waste the eyes and cause life to pine away. And you shall sow your seed in vain for your enemies will eat it." The situation is reiterated and extended in Deuteronomy 28: 22 ff. but as to what the infliction was, is not made more clear.

Deadly pestilences are alluded to in several places. The original, facetious, "cheerer-upper" is described in Psalms 41: 6-8, "And when one comes to see me, he utters empty words, while his heart gathers mischief; when he goes out, he tells it abroad. All who hate me whisper together about me; they imagine the worst for me. They say, 'A deadly thing has fastened upon him; he will not rise again from where he lies.'"

A plague of indefinite description but with disastrous consequences is recorded in the twenty-fifth chapter of Numbers. Textual critics believe two different stories are recorded here, the one having to do with the plague being contained in

verses 6-9, "And behold one of the people of Israel came and brought a Midianite woman to his family, in the sight of Moses and in sight of the whole congregation of the people of Israel, while they were weeping at the door of the tent of meeting. When Phinehas, the son of Eleazar, son of Aaron the priest, saw it, he rose and left the congregation, and took a spear in his hand and went after the man of Israel into the inner room, and pierced both of them, the man of Israel and the woman through her body. Thus the plague was stayed from the people of Israel. Nevertheless those that died by the plague were twenty-four thousand." Even at a relatively late date plagues were attributed to the Lord, Habakkuk 3: 5, "Before him went pestilence, and plague followed close behind." This remark was made perhaps as late as 300-odd years B.C.

In II Kings 19: 35-36 we read of a catastrophe which overtook Sennacherib, King of Assyria, as he lay siege to Jerusalem. The Assyrian King's army had sent the Hebrew army scurrying home to hide and had sent word to Hezekiah that he would take over all the Hebrews' possessions. As he lay siege to Jerusalem disaster befell his army. "And that night the angel of the Lord went forth, and slew a hundred and eighty-five thousand in the camp of the Assyrians; and when men rose early in the morning, behold, these were all dead bodies. Then Sennacherib, King of Assyria departed and went home, and dwelt at Ninevah." Now Herodotus, Greek historian, in Book II, page 141, of his history, records a story to the effect that the bowstrings of the Assyrians were devoured by field mice. Did Herodotus write figuratively? Was this plague?

The Philistines had both young and old men afflicted with a panic-causing disease when they captured the Hebrew Ark of the Covenant. I Samuel 5: 9 & 12, "But after they had brought it (the Ark) around, the hand of the Lord was against the city, causing a very great panic, and he afflicted the men of the city, both young and old, so that tumors broke out among them; the men who did not die were stricken with tumors, and a cry of the city went up to heaven." Was this bubonic plague? The tumors might make us think of this. If we read a little further along in I Samuel 6: 4-5 we find the Philistines send back the Ark with five golden tumors and five golden mice so they may be free from the plague. "And they (priests and diviners) said, 'What is the guilt offering that we shall return to him?' They answered, 'Five golden tumors and five golden mice, according to the number of the lords of the Philistines; for the same plague was upon all of you and upon your lords. So you must make images of your tumors and images of your mice that ravage the land, and give glory to the God of Israel, perhaps he will lighten his hand from off you and your gods and your land.'"

The Hebrew priests were the infectious disease experts and public health officers of these early times. The thirteenth chapter of Leviticus gives a detailed description of "leprous disease" and certain differential diagnoses. Unfortunately the Hebrew term "leprosy" has a wide range of meanings. A garment may be leprous and not because it is worn, Leviticus 13: 47-59. This affliction of the garment could be greenish or reddish in color and could have been mould or mildew respectively. It was treated as a disease for clothes were precious. The priest would shut up the garment for seven days; if the disease spread the garment was to be burned. If the spot could be dimmed by washing the priest cut out the spot and returned the garment.

Houses could be leprous as recorded in Leviticus 14: 33-53. Again this, as it is described, may have been mildew and mould. The treatment is the same, call the priest, who looks the situation over. If indicated he shuts the house for seven days. If the disease spreads the house is unclean. The affected plaster and stones were scraped off and thrown out. A replaster job had to be done. Anyone entering the house while under quarantine is considered unclean and must wash his garments.

Indeed it is difficult to be certain true leprosy is dealt with at all in these chapters. Nodular leprosy appears definitely not to be described. The leprosy we know about is not subject to such rapid evaluation, nor is the prognosis so generally optimistic as might be indicated herein. Chapter 13: 29-37 could readily pass for nothing more serious than ringworm, "When a man or woman has a disease on the head or the beard, the priest shall examine the disease; and if it appears deeper than the skin, and the hair in it is yellow and thin then the priest shall pronounce him unclean; it is an itch, a leprosy of the head or the beard. And if the priest examines the itching disease and it appears deeper than the skin and there is no black hair in it, then the priest shall shut up the person with the itching disease for seven days, and on the seventh day the priest shall examine the disease; and if the itch has not spread, and there is in it no yellow hair, and the itch appears to be no deeper than the skin, then he shall shave himself, but the itch he shall not shave; and the priest shall shut up the person with the itching disease for seven days more; and on the seventh day the priest shall examine the itch, and if the itch has not spread in the skin and it appears no deeper than the skin, then the priest shall pronounce him clean; and he shall wash his clothes, and be clean. But if the itch spreads in the skin after his cleansing, then the priest shall examine him, and if the itch has spread in the skin, the priest need not seek the yellow hair; he is unclean. But if in his eyes the itch is checked, and the black hair has grown in it, the itch is healed, he is clean; and the priest shall pronounce him clean."

In general the serious lesions had to be more than skin deep, be accompanied by color changes in the hair and continue to spread through two isolation periods of 7 days each. Baldness was readily differentiated from leprosy. One of the mild forms of leprosy described sounds considerably like psoriasis and the priest called the afflicted clean. It becomes apparent that several skin diseases are described in this section of Leviticus. Certainly no one can aver that isolation procedures were not carried out at an early date. References to lepers in both the Old and New Testaments are quite common and there is little doubt the disease has existed in that part of the country for many years.

It is not an uncommon practice to look for parallels to modern living in the Bible. Sometimes the imagination is stretched to the limit to accomplish such likenesses. If one's imagination is particularly pliable it can note an ancient covert act of Biological Warfare recorded in Genesis 34: 13-25. Certainly the able-bodied defenders in the camp of Shechem and Hanor are physically undone by a Hebrew-promoted infection. In this helpless state they pay dearly for a wrong done to one of the Hebrew camp.

It is believed by many the thorn in the flesh of the Apostle Paul was malaria contracted in the swamps along the southern coast of Asia during his first missionary journey. He recuperated considerably upon reaching higher ground, and may have had to reroute his trip to higher ground to keep going. II Corinthians 12: 7-10 tells of this thorn, "And to keep me from being too elated by the abundance of revelations, a thorn was given me in the flesh, a messenger from Satan to harass me (similar to Job), to keep me from being too elated. Three times I besought the Lord about this, that it should leave me; but he said to me, 'My grace is sufficient for you, for my power is made perfect in weakness.'"

In Acts 28: 8 Paul ministers unto a man with dysentery on the Isle of Malta, "It happened that the father of Publius lay sick with fever and dysentery; and Paul visited him and prayed, and putting his hands on him healed him." With the healing of this case of dysentery we conclude our search for microbes in the Bible. There are more references but the ones we have used serve to illustrate that the microbes we study today must have had some illustrious ancestors.

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VIRGINIA BRANCH SHOWS A WAY

Much has been written recently about the teaching of science in secondary schools and the need for creating an interest in a career in science in our high school children; undoubtedly, much more will be written before evidence of an improvement in the situation will be recognized by those concerned over the situation as they see it. Admittedly, it is easier to talk about creating an interest in science than to activate that interest. This is particularly true for the S.A.B. because of the nature of the science it represents.

A first step towards fostering interest of future scientists in microbiology has been made by the Virginia Branch of the S.A.B. This Branch has voted to establish an annual award in the Junior Academy of Science of the Virginia Academy of Science. The following statement has been submitted to the Council of the Virginia Academy for approval by that body:

General Statement for Presentation to the Virginia Academy of Science

The Virginia Branch of the Society of American Bacteriologists establishes an annual award of \$25.00 and a certificate of merit for the outstanding exhibit or scientific report on microbiology presented at the annual meeting of the Junior Academy of Science held in conjunction with the Virginia Academy of Science. This award is established to stimulate interest and research among future scientists in the various fields of microbiology. In addition, it will focus attention on the important role of microbial life, not only in relation to greater knowledge of the diseases of man, animal and plant, but will emphasize the role that micro-organisms play in agriculture and soil fertility, dairy and food industries, waste disposal, industrial fermentations and the many other effects of microbial life on our daily living.

The entries for this prize may be developed from original research, an exhibit illustrating some phase of microbial action, or a report based on a survey of scientific literature. Entries will be judged for original thought, comprehension of the subject, clarity of presentation, scientific accuracy and merit.

The entries shall be judged by a committee of the Virginia Branch of the Society of American Bacteriologists. Members of the Society shall be available to members of the Junior Academy to offer guidance and advice.

In the event that there are less than three entries in any given year or the entries are not of minimal caliber, the Society reserves the privilege

of suspending the award for that year. Honorable mention certificates shall be granted by the Awards Committee as it feels them to be merited by the contestants. An appropriate certificate shall be awarded to the teacher who counseled and guided the winner.

For further information, contact Dr. Wesley Volk, Dept. of Bacteriology, University of Virginia Medical School, Charlottesville, Va. or Abraham L. Rosenzweig, Clinical Laboratory, Veterans Administration Hospital, Richmond, Va.

ROUND TABLE DISCUSSIONS

The following letter should be of interest to the members of the S.A.B.:

Dear Dr. Bailey:

At the American Association of Dental Schools Meeting, March 24, 25, 26, 27, 1957 in Atlantic City, there will be a session on the Teaching of Bacteriology in Dental Schools. I am advising you of this session because it is an outgrowth of the Round Table Discussions held in New York and Houston in connection with the S.A.B. meeting for teachers of bacteriology in dental schools.

As an officer of the S.A.B., I am sure that you will be gratified to know that some benefits are derived by the Round Table Discussions held during the National Convention of the S.A.B.

The session in Atlantic City is being prepared by Dr. I. L. Shechmeister of the School of Dentistry, Washington University, St. Louis, Missouri. He is serving as Session Chairman and Dr. Donald E. Shay, Baltimore College of Dental Surgery, Dental School, University of Maryland is serving as co-chairman.

With kindest regards, I am,

Yours very truly,

MARION W. McCREA, Sec.-Treas.
Am. Assoc. of Dental Schools

A Bust of Noguchi

A bronze bust of the late Dr. Hideyo Noguchi, noted bacteriologist and Japan's foremost scientist, was presented to the Japanese Consul General on November 3rd by civilian employees of the Naval Air Station, Alameda, California.

The bust, the work of William Gordon Huff, a civilian employee at the Alameda naval station, is intended for trans-shipment to Japan and ultimate presentation to the Japanese people.

George P. Miller, Congressman for the 8th California District, assisted the Alameda Naval Air Station Association, in plans for the presentation. Assistance was also given by the Department of State and the Department of the Navy.

The idea of a monument to the internationally-

famous Noguchi originated before World War II through the personal friendship of Noguchi and an American professor.

The late Dr. Charles Atwood Koford of University of California at Berkeley, then Professor of Zoology and Chairman of that Department at the University, had also taught as a visiting professor at the Imperial University of Tokyo in the 1920's.

He became a great admirer of Noguchi and believed the man's death a martyrdom to the cause of better health for the peoples of the world. Some time after Noguchi's death, Dr. Koford conceived the idea of a monument as a method of bettering relations between Japan and the United States.

Dr. William H. Brown, now a Professor of Zoology himself at University of Arizona in Tucson, was studying for his doctorate under Dr. Koford at that time. It was he who contacted Mr. William G. Huff, presently an employee at Naval Air Station, Alameda, and commissioned him to create a model for the monument.

Mr. Huff completed the bust and in a letter dated February 19, 1956, Dr. Brown wrote to Mr. Huff as follows:

"Noguchi is one of your works that I will never forget. First, it is outstanding in every detail, and second it seems the proper time to present it with tensions lessened and the people of both countries trying to understand each other.

"It could very easily become the symbol of this good feeling and would be a work of art that the people of both countries could look upon with pride. I am very enthusiastic about the whole idea and would be proud to be named among the sponsors."

In addition to Dr. Brown, the president of the New Japan Aircraft Corporation, Mr. Masami Takasaki, during his recent visit here, expressed interest to the extent that he offered to finance the pedestal for the bust, the latter to be constructed of native Japanese marble.

William Gordon Huff, sculptor of the bust, received his art training at the College of Arts and Crafts, Oakland, California; the California School of Fine Arts, San Francisco; Beaux Arts, New York; Art Students League, New York; and Ecole Grande Chaumiere, Paris, France. He has completed monuments, statues, sculptured portraits and numerous California historical plaques. Prominent among his many works are the Civil War Monument, Bennington, Vermont; the Professor Fay Memorial, Tufts College, Medford, Massachusetts; and four 20 foot statues, Tower of Sun, Golden Gate. Mr. Huff offered free use of his civilian employee affiliation with the Navy as a means of completing the bronze bust for presentation to the Government of Japan as a symbol of Japanese-American good will. The Naval Air

Station Association volunteered several hundred dollars to bear the cost of casting the bust in bronze.

BOOKS RECEIVED AND REVIEWS

Annual Review of Microbiology. Volume 10. C. E. Clifton, Editor. Palo Alto, California: Annual Reviews Inc., 1956. vii + 426 pp. \$7.00.

A Practical Manual of Medical and Biological Staining Techniques. Second Edition. Edward Gurr. New York: Interscience Publishers, Inc., 1956. xvi + 451 pp. \$6.25.

Laboratory Manual of General Bacteriology. R. E. Hungate. New York: Scholar's Library, 1956. xii + 91 pp. \$2.00.

Fundamentals of Immunology. Third Edition. William C. Boyd, New York: Interscience Publishers, Inc., 1956. 790 pp. \$10.00.

Annual Review of Biochemistry. Volume 25. J. Murray Luck, Editor. Palo Alto, California: Annual Reviews Inc., 1956. x + 794 pp. \$7.00.

An Introduction to Cell and Tissue Culture, by The Staff of the Tissue Culture Course, 1949-1953, Cooperstown, N. Y.: Burgess Publishing Company, Minneapolis, Minn., 1955. 130 pp. \$4.00.

Originating as an outline to the laboratory exercises and lectures for those in attendance at the summer courses on tissue culture held yearly at Cooperstown, N. Y., this book appears to be a useful handbook and reference manual for all students and technicians engaged in cell and tissue cultivation. The techniques of tissue culture which have proven to be such a promising tool in investigations in the fields of cancer research, virology, and cellular biology, can, with the aid of this manual, be presented to the college student as a formal course.

The subject matter considered by the Staff of the Tissue Culture Course for laboratory instruction includes such basic procedures as the care and cleaning of glassware and the preparation of reagents used in cell cultures. Detailed outlines of techniques involved in the culture of assorted types of cells *in vitro* are given as well as descriptions of various types of tissue culture. Particular emphasis is placed upon the cultivation of cells from explants using the plasma clot technique—a procedure now quite well supplanted, although not completely, by the technique of trypsinized cell suspensions. Systems of tissue cultures described in detail include the slide culture which allows for a closer study of cell structure, test tube and flask cultures that offer a less expensive and more easily available cell culture, and sponge matrix cultures which encourage a more natural differentiation of the cultured cells.

In lecture discussions highly informative, but brief, chapters concerned with such subjects as the

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* 1956 Officers.

principal cell types, the patterns of culture growth, and the differentiation of cells in tissue culture, are presented. The nutrition and metabolism of cells *in vitro* are considered with respect to the information available on these subjects at this time. Additional chapters are included in this manual, each dealing with subjects and problems encountered in the experiences of tissue culture.

A valuable contribution to the student or investigator in this field is the list of references following the various chapters of this book. However, in spite of this excellent bibliography it is an unsurmountable problem to keep abreast of the ever increasing volume of literature concerning tissue culture. With this manual copyrighted in 1955 the latest references cited are from 1954 and, understandably, various methods, techniques and modifications of media have been reported in the last two years.

Designed for the instruction of persons assembled from the various fields of biology and medicine with a variety of requirements for tissue culture to fulfill, this manual offers a meritable general approach to tissue culture. It is, therefore, applicable as a laboratory guide for courses in cell tissue cultivation to be taught at the college level and as recommended reading for investigators in this field.

K. F. SOIKE

Photosynthesis and Related Processes, Vol. II, Pt. 2. Kinetics of Photosynthesis (continued), and addenda to Vol. I and Vol. II, Pt. 1. New York: Eugene I. Rabinowitch. Interscience Publ., Inc., 1956; 896 pp. \$18.50.

Eighteen years ago Eugene Rabinowitch, in order to familiarize himself with the subject, started to make a study of the then already extensive literature on photosynthesis. With unprecedented capacity for absorbing and correlating the enormous number of facts and hypotheses that had found their way into books and journals, he eventually achieved a comprehension of the general field that cannot fail to astonish those who are acquainted with the result, laid down in the three-volume treatise of which the last one has now been published.

Seven years after he started his exhaustive study, Vol. I appeared in print. It was immediately evident that this was not a mere compilation; with rare skill and insight the numerous aspects of the subject had been integrated into a solid structure. It may then have been regretted that the treatise was not yet complete; however, one could look forward to the publication of the sequel which was promised for early issuance.

Six years passed before Vol. II, Pt. 1, became available. Once again, those interested directly or indirectly could rejoice; the quality of this volume was on as high a level as that of the first install-

ment. Nevertheless, it was not yet "finished"; the treatment of the section on kinetics of photosynthesis was broken off in the middle. This was the result of an enormously increased activity in photosynthesis research; so much new information had accumulated that it was impossible to accommodate all of it in a single volume.

Now, after five more years, Vol. II, Pt. 2, has been published, and the most important compendium on photosynthesis has at last been completed. It contains not only the remaining subject matter that had originally been planned for inclusion in Vol. II, but Rabinowitch has added a number of additional chapters in which the supplementary material pertaining to the topics dealt with the earlier two volumes, and published after these had been printed, is discussed.

It is a pleasure, though not a surprise, to find that the treatment is again on a par with that of the previous volumes. Thus we may now feel that the entire field had been covered up to 1955. An especially important aspect is the inclusion of a great deal of Russian literature on the subject. After the practice gained ground of not including with the original Russian texts a summary in English, French, or German, much of this literature has often been difficultly accessible.

As before, the treatment testifies to Rabinowitch's immense knowledge, correlating ability, and critical attitude. It is equally important to stress that the latter has not led him to dismiss ideas or neglect facts that may be at variance with his own opinions; he has again presented all pertinent observations and hypotheses proposed by authors with often opposite viewpoints, and integrated them in a comprehensive and comprehensible manner. Thus, the now completed treatise represents an exhaustive historical account of the gradual development of a subject that is in a state of flux, and at present perhaps even more so than it ever was before. It is possible that those who are under the delusion that, at a certain stage, a field of scientific endeavor is "finished" may feel that notions that were prevalent ten years ago are now outdated, and should have been deleted from the discussion. But the serious scientist will recognise that this attitude, though not uncommon, is based on a misconception of the nature of science itself, and wholeheartedly subscribe to the view expressed by Rabinowitch at the end of the Epilogue:

"The author hopes that the method he has adopted to describe critically all the experiments, and discuss all the theories suggested to explain them, without committing himself too strongly to any one of them (and committing himself against them only when they infringe on general principles of physical chemistry, which—the author believes—can-

not be violated by organisms any more than by non-organic chemical systems), will prevent this monograph from becoming *obsolete* as rapidly as it will inevitably become *incomplete*" (p. 1993).

A particular example of such a situation can be found in the treatment of induction phenomena, some of which already are or soon may become interpretable in terms of chemical events that are now being elucidated, chiefly by the work of Calvin *et al.* While Rabinowitch clearly recognizes this, he rightly defends the approach adopted in Chapter 33 in the passage:

"... with the gradual clarification of the biochemistry of photosynthesis a tendency arises to inquire into the qualitative chemical sources of induction phenomena instead of analyzing the induction curves in terms of a minimum number of kinetic factors. This is inevitable and natural; but the considerable experimental work and ingenuity of interpretation invested in the study of induction kinetics (and of the kinetics of photosynthesis in general) should not be considered as wasted (as some biochemists are inclined to believe). They are fundamental contributions toward the general edifice of photosynthesis—and biochemistry in general—as an exact science" (p. 1429).

The Epilogue is a worthy counterpart of the introductory chapter of Vol. I in which the most important stages in the gradual evolution of ideas on photosynthesis were so splendidly presented; here we find, in the space of 15 pages, a well-documented warning against the unjustified optimism that a better understanding of the photosynthetic mechanism will lead to a rapid solution of the world's food problem; a brief summary of the major advances made during recent years; and an admirable discussion, on the basis of present-day understanding, of the major problems that remain to be solved.

A few disturbing inaccuracies may be mentioned; they can easily be corrected in subsequent editions. On pp. 1576 and 1585 lipoic acid is unfortunately referred to as a component of coenzyme A; on p. 1606 it would have been better to use polyphenol oxidase rather than cytochrome oxidase as an example of a copper-containing oxidase; on p. 1695 the formula $C_2H_4O_2$ instead of $C_2H_6O_2$ is used for glycol. Needless to say, such minor details, as also some typographical errors, do not detract in the least from the immense value of the book.

That Rabinowitch has been willing to spend 18 years in the preparation of this magnificent docu-

ment is something for which every one who is interested in one or more of the many aspects of the field of photosynthesis should be duly grateful!

C. B. Van Niel

NEWS OF OUR MEMBERS

Dr. Billy Kan has joined the staff of Continental Can Company's Metal Division, Research and Development Department, as a research engineer.

Dr. Maurice Green has been granted a Lalor Foundation Research award to study the metabolism of L-fructose in marine organisms at the Marine Biological Station, Woods Hole, Mass.

Dr. Werner K. Maas, New York University will study genetic control of enzyme synthesis in thermophilic mutants of *Escherichia coli* under a Lalor Foundation award at Woods Hole, Mass.

Dr. Claude E. ZoBell has been appointed chairman of the newly organized Division of Marine Biology at the University of California's Scripps Institution of Oceanography at La Jolla, Cal. The new Division consolidates the former divisions of Biochemistry, Botany, Fish Biology, Genetics, Microbiology, Invertebrate Zoology, Plant Physiology and Special Developments, including a staff of about 70.

Dr. Albert G. Moat, Hahnemann Medical College, has been awarded a Lalor Foundation award for study of techniques for selection of artificially induced mutants of yeast at Cornell University in the Department of Plant Breeding.

Dr. Mitsuru Nakamura, formerly at Boston University School of Medicine, has been appointed Associate Professor in Bacteriology and Chairman of the department at Montana State University, Missoula, Mont.

Dr. Aaron Novick, University of Chicago, will study induced enzyme activities as genetic characters under a Lalor Foundation award at Cold Spring Harbor Laboratory of the Long Island Biological Association.

Dr. Colin M. MacLeod, has been appointed Professor of Research Medicine at the University of Pennsylvania School of Medicine.

Dr. S. E. Hartsell has been appointed to the Sub-committee on Food Stability of the National Academy of Sciences-National Research Council.

Dr. M. Bauno Lobo, Instituto de Microbiologia da Universidade do Brasil, is working on neurotropic viruses at the Rockefeller Institute. Dr. Lobo is in this country on a Rockefeller Foundation Fellowship.

Dr. A. Cury, Instituto Oswaldo Cruz, Rio de Janeiro, has received a Guggenheim Fellowship and is working at the Haskins Laboratories, New York City.

NEWS AND MEETINGS OF LOCAL BRANCHES

Southern California Branch (H. E. Weimer, Secretary-Treasurer)

October 26, 1956. The meeting of the Branch was held in the Mission Room of the Pabst-Eastside Brewery, Los Angeles. The following papers were presented at the scientific session:

1. Lysozyme, Its Determination and Occurrence in Certain Diseases. O. E. Lobstein, Chem-Tech Laboratories, Beverly Hills.
2. Electron Microscopic Studies of Mycobacteriophage. Margaret I. Sellers, K. Tokuyasu and S. Froman, University of California, Los Angeles and Olive View Sanatorium, San Fernando, Cal.
3. The Selective Effect of the Intra cellular Environment upon Smooth and Non-Smooth *Brucella* Variants. John J. Holland and M. J. Pickett, University of California, Los Angeles.
4. Impressions of Laboratory Work in the Orient. Meridian R. Ball, University of California, Los Angeles.

Illinois Branch (J. C. Rickher, Secretary)

November 3, 1956. The Fall Meeting of the Branch was held at the Urbana-Lincoln Hotel, Urbana, Illinois. Dr. W. J. Nungester, University of Michigan, gave the evening address, speaking on "Host Non-Specific Defense Mechanisms." The afternoon session consisted of the following papers:

1. Preliminary Report on the Paleomicrobiology of Keewatin Sediments. Kenneth M. Madison, Division of Biological Sciences, University of Illinois, Chicago.
2. Adsorption Spectra of Cell-free Preparations from *Spirillum serpens*. Adaline N. Mather, Argonne National Laboratory, Lemont, Ill.
3. Oxidation of Glucose by Intact Ungerminated Spores of *B. terminalis*. G. G. Krishna Murty and H. Orin Halvorson, University of Illinois, Urbana.
4. Further Studies of L-Arabinose Degradation by *Aerobacter aerogenes*. M. J. Wolin, F. J. Simpson, and A. Wood, University of Illinois, Urbana.
5. Transmethylation Reactions in Bacteria. Stanley K. Shapiro, Argonne National Laboratory, Lemont, Ill.
6. Formation of L-Serine and Pyruvate from Glycine and Formaldehyde by *Clostridium acidurici*. J. V. Beck, R. D. Sagers and L. R. Morris, Brigham Young University, Provo, Utah and University of Illinois, Urbana, Ill.
7. Induction of Thymineless Death and Synchronized Division in *Salmonella typhimurium*. G. P. Kalle, University of Illinois, Urbana.
8. Tissue Culture Assay for Diphtheria Toxin.

E. S. Lennox and A. S. Kaplan, University of Illinois, Urbana, Ill.

9. Symposium; Mechanisms of Microbial Pathogenicity, S. S. Barkulis, Convener. Malarial Metabolism and Pathogenicity. J. W. Moulder, University of Chicago. Mechanisms of Staphylococcal Pathogenicity. R. D. Eckstedt, Northwestern University. Enteric Infections. William Burrows, University of Chicago. Pathogenicity of Influenza Virus. J. Emerson Kempf, University of Illinois College of Medicine, Chicago.

Michigan Branch (Elizabeth, J. Cope, Secretary-Treasurer)

December 1, 1956. The Branch met at the Whittier Hotel, Detroit, for a luncheon meeting. The following papers were presented at the scientific sessions:

1. The Use of Chicks in Potency Assay of Polio Virus Vaccine. E. A. Timm, E. Rope and I. W. McLean, Parke Davis and Co., Detroit.
2. Hydroxylation of Anthranilic Acid in the Biosynthesis of Niacine by *Escherichia coli*. W. McCullough, Wayne State University College of Medicine, Detroit.
3. A Phase Contrast Cinemicrography Study of Morphological Changes in Virus Infected Hela and Monkey Kidney Epithelial Cells. N. Y. Kramis and B. H. Hoyer, National Institutes of Health, Bethesda. Film provided by Dr. R. W. Sarber, Parke Davis and Co. from S.A.B. Visual Aids Committee.
4. Skin Grafting in Cattle as a Test for Monzygotic Twins. L. C. Ferguson, P. G. Nair, and G. H. Connor, Michigan State University, East Lansing.
5. Fermentation of Pentoses by *Lactobacillus pentosus*. E. C. Heath, J. Hurwitz and B. L. Horecker, National Institutes of Health, Bethesda, Md. and University of Michigan, Ann Arbor.
6. A Biological Assay for Albamycin. R. M. Smith, Upjohn Co., Kalamazoo, Mich.
7. L Colony Variants of *Micrococcus aerogenes*. T. L. Clogg and L. H. Mattman, Wayne State University, Detroit.
8. A Study of the Free Amino Acid Pools of De-embryonated Eggs Infected with Influenza A Virus. W. A. Shulls, Wayne State University College of Medicine, Detroit.

Missouri Valley Branch (J. O. Harris, Secretary-Treasurer)

March 23-24, 1956. The annual two day meeting of the branch was held at Kansas City. The first day's meeting was held at the University of

Kansas Medical Center, the second day's meeting at the University of Kansas City. The annual banquet was held March 23, at which Dr. H. Orin Halvorson spoke on "The Physiology of Bacterial Spores." The scientific session on the first day consisted of the following papers:

1. Epidemiological Studies of Tuleremia in Alaska. C. M. Downs, T. G. Metcalf, C. E. Hopla, W. T. Northey and R. W. Mitchell, University of Kansas, Lawrence.

2. The Effects of Variant Strains of *P. tularenses* on Linear Migration of Normal Guinea Pig Leucocytes *in vitro*. Robert Atchison and Cora M. Downs. University of Kansas, Lawrence.

3. Growth of "Strict" Aerobes under Anaerobic Conditions during the Methane Fermentation. L. R. Fina, Kansas State College, Manhattan.

4. Specificity of Flocculation Tests for Brucellosis. C. A. Hunter and Bernice Christesen. Kansas State Board of Health Laboratory, Topeka.

5. The Co-existence of Pathogenic Bacteria and Pseudomonads in Soluble Oil Emulsions. R. Samuel-Maharajha and H. Pivnick, University of Nebraska, Lincoln.

6. Recombination in *Nocardia corallina*. R. B. Webb, University of Oklahoma, Norman.

7. The Disinfection of Soluble Oil Emulsions. E. K. Fotopoulos and H. Pivnick, University of Nebraska, Lincoln.

8. Further Studies on the Relationship of *B. anthracis* to *B. cereus* and *B. cereus* var. *mycoides*. I Special Reference to the Non-rhizoid. Variant of *B. cereus* var. *mycoides*. Eric R. Brown and E. L. Treece, University of Kansas, Lawrence.

9. The Infectivity of the Mycelial Phase of *Histoplasma capsulatum*. V. E. Scholes, University of Oklahoma, Norman.

10. Metabolic Studies with Trypsin Treated *Mycobacterium tuberculosis* (H37RV). Shigeichi Uyeno and Warren E. Engelhard, University of Nebraska, Lincoln.

11. A Comparative Study of Type 2 Polioviruses. II Antigenic Differences Relating to 18 Type 2 Strains. Herbert A. Jenner, Paul Kamitsuka and Margaret Lenahan, University of Kansas, Kansas City.

12. The Bacterial Oxidation of Nitro-aromatic Compounds. N. W. Durham, Oklahoma A and M College, Stillwater.

13. Agglutination-Adsorption Studies of Certain *Pseudomonas* Species. R. M. Kline and T. H. Lord, Kansas State College, Manhattan.

14. The Effect of Chelating Agents on the Interaction of Bacterial and Phage Genetic Material. A. Eisenstark and C. Kirchner, Kansas State College, Manhattan.

15. Application of the Ouchterlony Technique in the Comparative Antigenic Analysis of Human and Monkey Sera. Julie A. Gempel, Alvar A.

Werder, and Perry Morgan, University of Kansas, Kansas City.

16. Production of Passive Anaphylaxis in the Mouse with Bovine Albumen and Homologous Anti-serum. Perry Morgan and Alvar A. Werder, University of Kansas, Kansas City.

17. Dehydrogenase Activity and Citrate Synthesis by Cell-free Preparations of *Rickettsia akari*. R. A. Consigli, D. Paretsky and C. M. Downs, University of Kansas, Lawrence.

18. An Epidemic of Histoplasmosis in Arkansas. Tom D. Y. Chin, Kansas City Field Station, U.S.P.H.S.

19. A Fructose Specific Strain of *Pseudomonas*. T. L. Thompson, H. Pivnick and John H. Pazur, University of Nebraska, Lincoln.

20. Antagonism of the Action of p. Amino-salicylic Acid on *Mycobacterium tuberculosis* by Methionine, biotin and Fatty Acids. Lloyd W. Hedgecock, Veterans Administration Hospital, Kansas City.

21. Evaluation of Antistreptolysin O Titers in the Human Host. Tom Hamilton, Antoni M. Diehl, Robert W. Weber, John S. May, Irving S. Snyder and Maellen Powell, University of Kansas, Kansas City.

The following papers were presented at the scientific session on the second day:

22. Correlative Bacterial Cytology. J. B. Clark, University of Oklahoma, Norman.

23. The Synthesis and Use of Fluorescent Compounds in Immunological Studies. John L. Riggs and T. G. Metcalf, University of Kansas, Lawrence.

24. Immunogenic Study of Poliomyelitis. Huskerville, Nebraska. Warren E. Engelhard, Paul F. Bancroft and Charles A. Evans, University of Nebraska, Lincoln.

25. The Use of Acid Dyes in Staining Chromatinic Structures. H. L. Chance, University of Oklahoma, Norman.

26. Microbiology and Tumor Chemotherapy. M. N. Mickelson and R. S. Flippin, Midwest Research Institute, Kansas City.

27. The Oxidation of Malic Acid by *Micrococcus lysodeikticus*. David V. Cohen, University of Kansas, Kansas City.

28. Studies of the Precipitation of Influenza Virus by Solutions of Inorganic Zinc. William Hausler and T. G. Metcalf, University of Kansas, Lawrence.

29. A Genetic Variant of Poliomyelitis Further Adapted to the Hela Cell. George R. Dubes and Margaret Chapin, University of Kansas, Kansas City.

30. The Oxidation of Soluble Oils and Components of Soluble Oils by *Pseudomonas formicans* and *Pseudomonas oleovorans*. L. R. Sabina and H. Pivnick, University of Nebraska, Lincoln.

31. Studies on Mesophilic Mutants of *Bacillus*

stearothermophilus. Jean Marsh and T. L. Thompson, University of Nebraska, Lincoln.

32. Epidemic of Polio-like Illness in Marshalltown, Iowa, Due to a Cocksackie-like Virus. Patrick Lehan, Kansas City Field Station, U.S.P.H.S.

33. Influence of Routes of Inoculation on the Dissemination of GDV11 Virus within the Mouse. Thorkill Jensen and Alvar A. Werder, University of Kansas, Kansas City.

34. Modification of U. V. Sensitivity of *Neurospora* and Phage. V. Woodward, V. Swarup, E. Mora and A. Eisenstark, Kansas State College, Manhattan.

35. Non-enzymatic Reduction of DPN⁺ by Alpha-keto glutarate. D. Paretsky and R. A. Consigli, University of Kansas, Lawrence.

36. Immunizing Factor in Feces of Mice Infected with GDV11 Virus. Alvar A. Werder and Thorkill Jensen, University of Kansas, Kansas City.

37. Comparison of Rates of Utilization of Various Hydrocarbons by Certain Bacteria. John O. Harris, Kansas State College, Manhattan.

New Jersey Branch (M. Grimm, Secretary)

October 25, 1956. The October meeting of the Branch consisted of an address by Dr. Francis J. Ryan, Department of Zoology, Columbia University, *Microbial Genetics* in Japan. The meeting was held at the Institute of Microbiology, University Heights Campus, Rutgers University.

November 15, 1956. The Branch met at the Research and Development Division of Merck and Co., Rahway, N. J. The scientific session consisted of a symposium "Microbial Synthesis and Transformation of Steroids."

1. The Microbial Synthesis of Steroids. Thomas H. Stoudt, Merck and Company, Inc.

2. Microbial Preparation of 1-Dehydrosteroids. William Charney, Schering Corporation.

3. The Effect of Physical Variables on the Microbiological Transformation of Steroids. Demetre N. Tetsiavas, Merck and Company, Inc.

Eastern New York Branch (Sally M. Kelly, Secretary-Treasurer)

October 25, 1956. The Fall Meeting of the Branch was held at Rensselaer Polytechnic Institute, Troy, N. Y. Following a business meeting, the following papers were presented:

1. Increase in Bactericidal Activity as a Result of Injection of Zymosan. Benjamin Blattberg, Veterans Administration Hospital, Albany.

2. Isolation from Soil of Actinomycete Cultures Pathogenic to Frogs. Phyllis L. Throop, Henry L. Ehrlich and Roland Walker, Rensselaer Polytechnic Institute, Troy.

3. Present Status of Chemoprophylaxis and

Chemotherapy of Viral Diseases. Randall L. Thompson, Sterling-Winthrop Research Institute, Rensselaer, N. Y.

4. Some Characteristics of the Hospital Staphylococcus. Dumont Elmendorf, Division of Laboratories, New York State Department of Health, Albany.

New York City Branch (Jackson S. Kiser, Secretary)

October 16, 1956. The Seventy-fifth Meeting of the Branch was held at Memorial Hospital Auditorium, New York City. The scientific program consisted of the following papers:

1. *Mycobacterium paraffinicum* n. sp., a Bacterium Isolated from Soil. John B. Davis, Magnolia Petroleum Co., Dallas, Texas.

2. Some Effects of Temperature and Pressure on Microbial Activity. Claude E. ZoBell, Scripps Institution of Oceanography, LaJolla, Cal.

Ohio Branch (Rosemary Bole, Secretary-Treasurer)

November 1, 1956. The following officers for 1956-57 were elected at the annual business meeting of the Branch: President, F. J. Murray, The Wm. S. Merrell Co., Cincinnati 15, O.; Vice-President, C. C. Croft, Ohio Health Laboratories, Columbus 10, O.; Secretary-Treasurer, Mrs. Rosemary Bole, Ohio State University, Columbus, O.

Mr. Eugene Nester, Western Reserve University, was awarded a prize for the best paper presented by an individual below the doctorate level.

The following papers were presented at the scientific session:

1. The *in vitro* Susceptibility of Pleuropneumonia-Like Organisms to Action of Erythromycin, Hygromycin and Streptomycin. A. Hamdy, E. H. Bohl and V. L. Sanger, Ohio Agricultural Experiment Station, Wooster.

2. Some Special Aspects of Lysogeny in Streptomyces. Elwood B. Shirling, Ohio Wesleyan University, Delaware.

3. Experimental Immunization of Mice with Soluble Antigens from *Shigella* and *Salmonella* Types. John A. Muhlenpoh, The Wm. S. Merrell Co., Cincinnati.

4. Bacterial Growth and Food Supply. James V. Lawrence, Ohio University, Athens.

5. Inhibition of Rho (D) Antibody by Eluates from Rho (D) Erythrocytes Treated with Mumps Virus. Robert W. Chandler, and Nancy J. Bigley, Ohio State University, Columbus.

6. Studies on Saliva of Caries-immune Humans. Gordon E. Green and Matthew C. Dodd, Ohio State University, Columbus.

7. A Report on an Experimental Method for Detecting Bacteriological Contamination on Surfaces. Robert Angelotti and Milton J. Foter,

Robt. A. Taft Sanitary Engineering Center, Cincinnati.

8. Sterilization of Dental and Surgical Instruments by Ethylene Oxide Vapor. Saul Kaye and Grant D. Darker, Ben Venue Laboratories, Bedford.

9. A Report on Biochemical Studies on the Cell Walls of Actinomycetes.

10. Bacteriological Procedures Resulting in Increased Isolations of Significant Serological Types of Group A Streptococci in a Rheumatic Fever Throat Culture Program. Earl E. Long, Akron Department of Health, Akron.

11. The Significance of the Mouse Test in Animals Suspected of Rabies. L. F. Ey, Stella B. Milburn and V. E. Sullivan, Ohio Department of Health, Columbus.

12. Antigenic Relationship of Lepromin and Old Tuberculin as Studied by Agar Diffusion. R. G. Burrell and M. S. Rheins, Ohio State University, Columbus.

13. A Report on the Effect of Metabolites on Reactivation of Heat and Chlorine Treated *Escherichia coli*. Cecil W. Chambers, Henry H. Tabak and Paul W. Kabler, Robert A. Taft Sanitary Engineering Center, Cincinnati.

14. Free Amino Acids in the Blood and Urine of Hamsters Infected with *Leptospira pomona*. W. B. Frizette, E. H. Bohl and G. L. Stahley, Ohio State University, Columbus.

15. Thioplocia. Chester I. Randles, Ohio State University, Columbus.

16. The Selective Inhibition of Bacteriophage Synthesis. Eugene Nester and John Spizizen, Western Reserve University, Cleveland.

17. Enzymatic Activation of Amino Acids. John A. DeMoss, Western Reserve University, Cleveland.

Eastern Pennsylvania Branch (Theodore G. Anderson, Secretary-Treasurer)

November 27, 1956. The 259th meeting of the Branch was held at the Medical Alumni Hall, School of Medicine, University of Pennsylvania. The scientific session was devoted to an address by Colin M. MacLeod: *A Medical Mission to Moscow*.

Rio de Janeiro Branch (Laerte Andrade, Secretary-Treasurer)

July 31, 1956. The 21st meeting of the Branch was held at the Brazilian Press Association Building. The scientific session consisted of the following papers:

1. Ophthalmic Listerosis in Rabbits. Genesio Pacheco and Vinicins M. Dias, Instituto de Oswaldo Cruz.

2. Studies on the Microbiological Assay of Choline. A. Cury and Marylena P. Barreiros, Universidade do Brasil.

3. Electron Microscopy of Granules in *Proteus*

vulgaris Treated with Triphenyltetrazolium Chloride. M. Thiago de Mello, Niber Paz, M. da Silva and Hans Muth, Instituto Oswaldo Cruz.

4. Cutaneous and Hair Lesions of Metameric Distribution in Mice Inoculated with Group B Cocksackie Virus. J. Travassos, Domingos de Paola, J. V. Vasconcelos, N. M. Schwartz, R. Goldgheil and Paulo de Goes, Universidade do Brasil.

September 28, 1956. The 22nd meeting of the Branch, held at the Instituto de Puericultura da Universidade do Brasil, was devoted to a symposium on *Development of Microbiology in Brazil*.

1. Teaching in Microbiology. Paulo de Goes, Universidade do Brasil.

2. Fellowship for Research in Scientific Institution. Gobert A. Costa, Instituto Oswaldo Cruz.

3. Research in Medical, Veterinary and Agricultural Microbiology. Genesio Pacheco, Instituto Oswaldo Cruz.

4. Microbiology and Industry. Raymundo Moniz de Aragao, Universidade do Brasil.

5. Creation of "Sociedade Brasileira de Microbiologia". Milton T. de Mello, Instituto Oswaldo Cruz.

November 20, 1956. The meeting of the Branch was held at the Brazilian Press Association Building. The following officers were elected to serve during 1957: President, A. E. Arêa Leão, Instituto Oswaldo Cruz; Vice-President, Raymundo Moniz de Aragão, Escola Nacional de Química; Secretary-Treasurer, Laerte de Andrade, Instituto Oswaldo Cruz; Councilor to S.A.B., Amadeu Cury, Haskins Laboratories, New York. The scientific session consisted of the following papers:

1. An Epidemic of Inclusion Blenorrhea. Genesio Pacheco, N. Cavalcanti and Madureira Pará, Instituto Oswaldo Cruz.

2. Circulating Antibody Titer in Patients after Anti-tuberculosis Vaccination by the Concurrent B.C.G. Method. Moyses A. Fuks, Universidade do Brasil.

3. Relations between Glauders and Brucellosis. Genesio Pacheco, Instituto Oswaldo Cruz.

4. Some Observations on the Genetics of *Mycobacterium smegmatis* with Special Reference to Streptomycin Resistance. C. Sole-Vernin and Chana Malogolowkin, Universidade do Brasil.

Virginia Branch (B. H. Caminita, Secretary-Treasurer)

May 11, 1956. The spring meeting of the Branch was held at Richmond. The following slate of officers was elected to take office January 1, 1957: President, Dr. Wesley Volk, Department of Microbiology, University of Virginia Medical School, Charlottesville; Vice President, Mrs. B. H. Caminita, Office of Naval Research, Washington, D. C.; Secretary-Treasurer, Dr. Miles Hench

Clinical Laboratory, Medical College of Virginia, Richmond.

The following papers constituted the scientific program:

1. Lactose Urea Iron Agar; A New Differential Tube Medium for Isolation of Salmonella. J. M. Sieburth, Virginia Agricultural Experiment Station, Blacksburg.
2. A New Serological Technique: Freeze-Agglutination. 1. Application to Chronic Respiratory Diseases of Chickens. C. H. Domeruth and E. P. Johnson (with technical assistance of A. P. Tichelaar MT/ASCP), Virginia Agricultural Experiment Station, Blacksburg.
3. Experimental Encephalomyelitis in Cats. P. Y. Paterson, E. D. Brand and M. I. Hansrote, Department of Microbiology and Department of Pharmacology, University of Virginia School of Medicine, Charlottesville.
4. An Unusual Colonial Formation by a Strain of *Pseudomonas rubinosa*. H. J. Welshimer, Medical College of Virginia, Richmond.
5. Antigenic Components of *Lactobacillus lactis*. R. H. Miller and P. A. Hansen, Department of Bacteriology and Livestock Sanitary Service Laboratory, University of Maryland, College Park, Maryland.
6. Form Variation and Electrophoresis. Shelley Harrell and P. A. Hansen, Livestock Sanitary Service Laboratory, University of Maryland, College Park, Maryland.
7. Some Probable Causes of Pollution in the Shellfish Industry from Its Harvest to the Marketed Product. R. T. Hill, Virginia State Dept. Health, Whitestone.

October 27, 1956. The fall meeting of the Branch was held in conjunction with the Virginia Public Health Association at the University of Virginia

School of Medicine, Charlottesville. The scientific program consisted of a panel of invited speakers on the topic "Civil Defense for Microbiologists and Public Health Personnel" as follows:

1. Bw and Its Defense. Leroy Fothergill, M.D., Scientific Advisor, Biological Warfare Laboratories, Fort Detrick, Md.
2. The Role of the Biological Laboratory in Civil Defense. Robert L. Smith, M.D., Federal Civil Defense Administration.
3. Potentialities and Feasibilities of Biological Warfare (emphasis on rapid isolation and diagnoses). Donald S. Martin, M.D., Chief, Bacteriology Section, Communicable Disease Center, Chamblee, Ga.
4. Introduction and Health Problems in Modern Warfare. George Adams, M.D., Chief, Civil Defense Training Section, Communicable Disease Center, Chamblee, Ga.

Washington Branch (Howard Reynolds, Secretary-Treasurer)

October 23, 1956. The 211th meeting of the Branch was held at the Walter Reed Army Institute of Research, Army Medical Center. The following papers were presented at the scientific session:

1. The Localization of Sites of Absorption of Streptococcal Hyaluronidase Using Fluorescent Antibody. Emil W. Emmart, National Institute of Arthritis and Metabolic Diseases.
2. The Lyophilization of Some Clostridium Strains. William Arthur Clark and Joan S. Paroni, American Type Culture Collection.
3. Differentiation of the Antilipids in Non-Treponemal Diseases and Syphilis. J. F. Kent, D. P. Carroll, and L. A. Simonton, Walter Reed Institute of Research.

NEW MEMBERS

New Active Members

October 10, 1956 through November 18, 1956

- Arakaki, Jiro, Dept. of Health, Wailuku, Maui, T. H., Hawaii
- Bumzahem, Carlos B., Dept. of Bact. Sch. of Med., The Univ. of Illinois, 808 S. Wood St., Chicago, Illinois
- Ching, George Q. L., Territorial Health Dept., P.O. Box 3378, Honolulu, T.H., Hawaii
- Clark, Genevieve E., 500 Clayton St., Georgetown, Ky.
- Fernandes, George B., P.O. Box 1508, Lihue, Kauai, T. Hawaii
- Howell, Arden, Jr., National Inst. of Dental Res., National Insts. of Health, Bethesda 14, Maryland
- Lefebvre, Marcel, Maisonneuve General Hosp.,

- 5415 Blvd. L'Assomption, Montreal 36, Quebec, Canada
- Maruzzella, Jasper C., 330 8th Ave., Pelham, N. Y.
- McLimans, William F., Belvoir and New Hope Rd. #3, Plymouth Valley, Norristown, Pa.
- Minette, Henri P., P.O. Box 916, Hilo, Hawaii
- Papa, Marco J., Dept. of Bacteriology, Research Inst., Walter Reed Army Med. Center, Washington, D. C.
- Ramsaran, Jo Carol Ayres, Branden Sanatorium Ste. 6, Branden, Manitoba, Canada
- Spong, Henry Douglas, Dept. of Bacteriology, Sch. of Medicine, George Washington Univ., Washington 5, D. C.
- Westcott, Dorothy Ellen, 1919 Mackin Rd., Flint 4, Michigan
- Ziv, David S., Smith, Kline & French Labs., 1530 Spring Garden St., Philadelphia, Penna.

VIRUS STRAINS

The American Type Culture Collection has recently acquired, as part of its Viral and Rickettsial Registry, preparations of the following virus strains: ECHO (types 1, 2, 3, 4, 5, 6, 14); APC (types 1 to 8 incl.), Fibroma (Patuxent strain). Inquiries concerning them are invited. Note new address: 2112 M St., N. W., Washington 7, D. C.

ACTINOMYCETE CULTURES WANTED

The undersigned would like to hear from anyone having cultures of the following organisms:

Streptomyces aurantiacus
S. longissimus
S. longisporoflavus
S. viridans

John B. Routien
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